REMARKS

The Examiner's attention to the present application is noted with appreciation.

The Examiner objected to the drawings under 37 C.F.R. § 1.83(a). An added drawing and corresponding changes to the specification are submitted herewith which do not add new matter to the application, but rather only illustrate the embodiments discussed in the specification as filed.

The Examiner rejected claims 1, 3, 5-6, 8-10, and 23 under 35 U.S.C. § 103(a) as being unpatentable over Mellitz in view of Kerschner et al. ("Kerschner"). The rejection is traversed.

With respect to claims 1 and 23, one of ordinary skill in the art would not have looked to Kerschner for means to improve the device of Mellitz. Mellitz discloses a technique for taking TDR measurements on interconnect traces of a bare PWB. Kerschner disclosed a probe that comprises a capacitive plate used to determine open and short circuits on IC chip packages mounted on a PCB. Kerschner is concerned with orienting a single probe plate above an IC chip package, while Mellitz requires placement of two points (signal and ground probes) on wire traces. The present invention solves the difficulties of accurately placing the two points (in X, Y, and Z axes) automatically so that they touch without damaging electrical components involved in the measurements.

With respect to claim 3, there is no discussion or suggestion in either reference that differential TDR measurements are even possible, let alone desired.

With respect to claim 5, neither reference discloses or suggests a probe assembly changing station. Furthermore, as discussed below, Sinsheimer does not disclose but rather teaches away from a probe assembly changing station. Rather, it teaches a manual method and apparatus for exchange of probe cards.

With respect to claim 6, Mellitz does not show a calibration station accessible by a robotic arm. Rather, it shows a simple airline that may be manually used. The present invention provides a calibration station which requires a circuit board permitting automatic access of the airline by the probe assembly.

With respect to claim 8, Mellitz does not mimic electrical characteristics of a coaxial structure. In Mellitz it is not the probe assembly that mimics a coaxial structure but rather the referee impedance standard (airline)!

With respect to claim 10, Kerschner does not discuss or suggest importing CAD data to automatically generate test plans for a circuit.

The Examiner rejected claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Mellitz in view of Kerschner and Swart. The rejection is traversed.

The defects of Mellitz and Kerschner discussed above apply equally to this ground of rejection, and Swart does not cure those deficiencies. Furthermore, Swart discloses two robotic arms, but one drives a single signal probe and the other a single ground probe. Accordingly, Swart is incapable of performing differential TDR, which requires simultaneous use of two signal probes.

The Examiner rejected claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Mellitz in view of Kerschner and Sinsheimer et al. ("Sinsheimer"). The rejection is traversed.

The defects of Mellitz and Kerschner discussed above apply equally to this ground of rejection, and Sinsheimer does not cure those deficiencies. Furthermore, Sinsheimer actually teaches away from a probe assembly changing station holding a plurality of probe assemblies. Although Sinsheimer refers to its device as a whole as an "autoloader", it in fact merely has a start position at which probe cards can be manually changed (col. 9, lines 16-29 and 39-44).

The Examiner rejected claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Mellitz in view of Kerschner and Bottman. The rejection is traversed.

The defects of Mellitz and Kerschner discussed above apply equally to this ground of rejection, and Bottman does not cure those deficiencies. Furthermore, none of the references, including Bottman, provide or suggest the capability for either the claimed accuracy of measurements nor testing traces as

short as 0.5 inches. This is not a matter of "optimum or workable" ranges but rather of ranges that were not possible before the advent of the present invention.

The Examiner rejected claims 11, 19, and 26 under 35 U.S.C. § 103(a) as being unpatentable over Mellitz in view of Kerschner and Cram et al. ("Cram"). The rejection is traversed.

The defects of Mellitz and Kerschner discussed above apply equally to this ground of rejection, and Cram does not cure those deficiencies. Furthermore, one of ordinary skill in the art would not look to Cram for solutions in TDR technologies. Cram is directed to detection of electrical characteristics of a well borehole, and has nothing to do with testing of electronic circuitry.

The Examiner rejected claims 12 and 24 under 35 U.S.C. § 103(a) as being unpatentable over Kerschner in view of Sinsheimer. The rejection is traversed.

The defects of the cited references have been discussed above with respect to the rejections of claims 4 and 5.

The Examiner rejected claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Kerschner in view of Sinsheimer and Mellitz. The rejection is traversed.

The defects of the cited references have been discussed above with respect to the rejections of claims 4 and 5.

The Examiner rejected claims 14-18 and 25 under 35 U.S.C. § 103(a) as being unpatentable over Mellitz in view of Kerschner. The rejection is traversed.

The defects of the cited references have been discussed above with respect to the rejections of claims 2 and 3. Neither disclose or suggest differential TDR methods or apparatuses.

The Examiner rejected claims 20 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Mellitz in view of Kerschner and Bottman. The rejection is traversed.

The defects of the cited references have been discussed above with respect to the rejection of claim 7.

The Examiner rejected claims 21, 22, and 28 under 35 U.S.C. § 103(a) as being unpatentable over Mellitz in view of Kerschner. The rejection is traversed.

The defects of the cited references have been discussed above with respect to the rejection of claim 6.

Being filed herewith is a Petition for Extension of Time to September 9, 2002, with the appropriate fee. Authorization is given to charge payment of any additional fees required, or credit any overpayment, to Deposit Acct. 13-4213. A duplicate of this paper is enclosed for accounting purposes.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached paper is captioned "**Version with Markings to Show Changes Made**."

An earnest attempt has been made to respond to each and every ground of rejection advanced by the Examiner. However, should the Examiner have any queries, suggestions or comments relating to a speedy disposition of the application, the Examiner is invited to call the undersigned.

Reconsideration and allowance are respectfully requested.

Respectfully submitted,

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Version with Markings to Show Changes Made

In the specification:

On page 7, change the paragraphs at lines 13-16 to read as follows:

Fig. 10 is a perspective view of the robot arm after having removed a probe tip assembly from the probe tip changer assembly area; [and]

Fig. 11 is a side view of the calibration/verification assembly employing a NIST calibrated air line; and [.]

Fig. 12 is a perspective view of the measurement robot assembly of an embodiment for differential TDR employing two robotic arm assemblies each with signal/ground probes.

Change the paragraph on page 13, lines 14-17, to read as follows:

Differential DR probing on printed wiring board ("PWB") cards, as opposed to test coupons, sometimes dictates the need for two (2) independently moving arms **50,50'** as part of the robot, as shown in Fig. 12. Each arm holds a single probe mechanism with signal probe **100** or **100'** respectively and ground probe **110** or **110'** respectively. In this manner the system can independently place each of the two probes as required to carry out the differential TDR testing.